SASKATCHEWAN BRANCH

Canadian Seed Growers' Association

REPORT

of the

TWENTY-FIRST

ANNUAL MEETING

held at

University of Saskatchewan

SASKATOON

★

January 10th, 1950

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OFFICERS, 1950

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ADDRESS OF WELCOME

PROFESSOR M. J. CHAMPLIN
Field Husbandry Department
University of Saskatchewan
Saskatoon

It gives me real pleasure to have this opportunity to extend words of welcome to the members of the Saskatchewan Branch of the Canadian Seed Growers' Association on behalf of the University. I was present at the founding of your organization and have been present at nearly all of your meetings since that eventful day. Now that you have come of age and are celebrating your 21st anniversary it seems most appropriate to say that you have fought a good fight, you have made a sound substantial growth, you have had good leadership and you have added much to the strength of your parent organization, the great Canadian Seed Growers' Association. There is much work yet to be done; the problems are many but I feel confident that you will go forward in the future, overcoming obstacles and carrying on the good work of registered seed production.

In North America, there are 37 crop improvement or seed growers' associations of dominion, provincial or state wide scope. Membership varies from time to time but if we estimate that there are 40,00 individual members, that would be equivalent to one in 4,000 of the total population in Canada and the United States. These organizations are federated in the International Crop Improvement Association. The importance of the work done by these seed growers is out of all proportion to the number involved in it. The food supplies of all the people depend upon the work of the seed growers. Good soil management and conservation coupled with the use of the best possible seeds of adapted varieties are the basis for maintaining the civilization of which we are all proud and of course good seeds cannot be sown unless they are first produced.

In order to have soil conservation we must have seed supplies of well adapted varieties of legumes and grasses. In my experience, in trying to introduce adapted varieties of all of the field crops, I have found that farmers in general are very conscious of wheat varieties but that it seems to be much more difficult to inculcate consciousness of varieties of grasses, legumes and rye.

For example, we began distributing Thatcher wheat in 1936 and now about 70 percent of the acreage is Thatcher. But on the other hand, we have distributed Superior brome grass, Arctic sweet clover and Prolific spring rye for many years and we find that many of the farmers and some of the commercial seedsmen, still completely lose track of the name of the variety they are growing or selling. This is very unfortunate as these varieties are true to their names, Superior, Arctic and Prolific. Your organization can do much to advance this knowledge of variety names of crops other than wheat.

I realize that there are many problems. Regulations should be strict enough to insure quality but not so strict as to prevent a good

volume of production. Seed producers have to contend with bad weather and pests, the same as other farmers and marketing is always a difficult problem. Public demand is very erratic and hard to foresee. One year, everybody may want one variety. The next year, only a few want it. The reasons for these sudden shifts in demand are hard to find. This sudden shifting from this to that may become less prevalent as our country gets older. More educational work regarding the value of good, adapted varieties may help to keep the demand more even from year to year.

I feel confident that these problems will continue with us for a long time but I have equal confidence that your officers and members can and will do much to solve them.

Your past record is good, your present efforts are sound and the future lies before you with all its challenges for a greater and better development of the Saskatchewan Branch of the Canadian Seed Growers' Association. It is my sincere wish that your deliberations at this 21st Annual Meeting may be fruitful and that your stay at your University may be most pleasant. In short, you are welcome.

REPORT OF THE SECRETARY

V. B. HOLMES
Saskatchewan Department of Agriculture
Regina

TABLE 1: The estimated production in bushels of field inspected grain in Saskatchewan in each of the crop years 1946-49.

Variety	1946	1947	1948	1949
Thatcher	994,150	1,118,063	3,254,965	3,574,479
Regent	29,788	33,640	55,290	43,345
Garnet	2,675	4,218	4,795	1,560
Renown	40	.....	.....	.....
Apex	5,375	10,220	17,602	18,270
Marquis	725	1,525	3,890	864
Redman	110	11,287	66,698	81,823
Rescue	.....	30,185	38,460	24,337
Saunders	.....	135	518	42,982
Red Bobs	.....	.....	10	.....
Kharkov	.....	112	170	1,700
Pelissier	8,807	2,790	4,560	6,200
Stewart	25	4,752	10,983	7,898
Carleton	1,111	2,850	1,975	11,930
Mindum	.....	1,500	.....	.....
Sask. 22-35	.....	.....	.....	140
Yogo	.....	.....	.....	100
Total Wheat	1,042,806	1,221,277	3,459,916	3,815,628

Ajax	240,822	244,608	426,865	189,720
Victory	109,212	165,559	337,707	109,543
Vanguard	30,715	19,375	16,580	7,480
Banner	22,465	11,610	19,035	10,556
Exeter	70,925	113,465	415,100	257,580
Valor	7,830	4,590	6,655	2,435
Cartier	1,800	935	2,070	460
Garry	.....	10,820	50,155	16,405
Legacy	810	.....	.....	.....
Larain	.....	1,100	11,090	4,105
Eagle	.....	.....	2,500	.....
Beacon	.....	200	3,400	.....
Roxton	40	20	.....	.....
Clinton	.....	.....	500	1,355
Fortune	.....	.....	.....	4,062
Total Oats	484,619	572,282	1,291,657	603,701
O.A.C. 21	144,819	419,014	101,522	43,940
Plush	25,600	32,535	30,015	11,800
Hannchen	3,165	10,370	2,595	1,625
Warrior	2,160	4,435	2,889	3,339
Rex	3,960	3,670	7,795	.....
Regal	1,500	5	.....	.....
Newall	.....	875	5,320	.....
Titan	25,706	20,125	13,438	3,210
Montcalm	43,276	278,598	748,295	149,793
Olli	450	850	180	1,200
Sanalta	.....	1,560	1,680	.....
Gartons	.....	150	.....	.....
Vantage	.....	.....	512	2,990
Campana	.....	.....	.....	21
Total Barley	250,636	502,187	914,241	217,918
Royal	30,282	72,196	122,291	2,094
Redwing	11,666	24,738	47,846	6,497
Dakota	.....	104	6,430	11,116
Victory	.....	.....	2,040	.....
Rocket	.....	.....	.....	2,096
Total Flax	41,951	97,038	178,607	21,803
TOTALS	1,820,012	2,392,784	5,844,421	4,659,050

TABLE 2: The final disposition of the 1948 field inspected seed crop as reported by seed growers in Saskatchewan.

Variety	Estimated Bushels Threshed	Percentages of Threshed Seed Crop				
		Sold as Seed	Used by Grower	Total as Seed	To Elevator	Carried Over
Thatcher	2,874,134	63.8	10.8	74.6	16.9	8.5
Redman	75,969	45.4	9.3	54.7	24.5	20.8
Regent	48,102	82.5	9.7	92.2	5.9	1.9
Rescue	30,306	73.3	12.0	85.3	5.2	9.5
Apex	11,582	74.9	17.2	92.1	6.3	1.6
Marquis	3,299	42.5	4.5	47.0	39.4	13.6
Total Wheat	3,043,392	63.7	10.8	74.5	16.8	8.7

Ajax	395,704	23.6	8.5	32.1	33.8	34.1
Exeter	447,477	70.5	7.5	78.0	13.7	8.3
Victory	260,034	47.3	11.7	59.0	9.8	31.2
Others	67,351	38.6	16.1	54.7	25.1	20.2
Total Oats	1,170,566	40.9	9.6	50.5	23.4	26.1
Montcalm	873,260	14.7	5.6	20.3	50.1	29.6
O.A.C. 21	61,319	33.6	5.4	39.0	38.1	22.9
Plush	28,094	23.7	8.3	32.0	59.1	8.9
Others	18,472	15.7	18.0	33.7	16.1	50.2
Total Barley	981,145	17.2	6.2	23.4	48.1	28.5
All Flax	160,676	3.1	1.7	4.8	74.6	20.6
Total All Varieties	5,355,779	55.4	10.1	65.5	21.1	13.4

TABLE 3: Average disposition of field inspected seed crops for all varieties of wheat, oats, barley and flax 1939-48 inclusive.

Year	Estimated Bushels Threshed	Percentages of Threshed Seed Crop				
		Sold as Seed	Used by Grower	Total as Seed	To Elevator	Carried Over
1948	5,355,779	55.4	10.1	65.5	21.1	13.4
1947	1,966,119	82.1	7.9	90.0	5.8	4.2
1946	1,540,430	65.9	11.0	76.9	14.8	8.3
1945	1,361,846	65.2	9.5	74.7	14.4	8.7
1944	1,036,673	55.5	10.0	65.5	12.4	19.4
1943	771,052	65.1	10.5	75.6	10.7	10.7
1942	884,405	38.4	9.4	47.8	21.0	27.4
1941	530,748	61.0	15.0	76.0	10.0	14.0
1940	1,131,999	26.4	9.7	36.1	50.4	13.5
1939	1,362,209	35.0	13.0	48.0	34.0	18.0

ADDRESS OF PRESIDENT

J. FARQUHARSON

Zealandia.

Once again we are gathered together at our great University during Farm and Home Week, for this our 21st Annual Meeting. Our Association is one of several organizations participating in, and deriving many benefits from this Annual get-together. Not only do we find here opportunities of discussing our own problems, but we also enjoy the privilege of getting better acquainted with the technical personnel of the University, who are working continually for the betterment of Agriculture. The Seed Grower is an important link between the University and the farmer. At our University many new varieties of crops are produced, and it falls upon the Elite growers and other Seed Growers to multiply the allotments of Foundation Stock to the point where seed in quantity is available for general distribution to the farmers of the Province. It is the Seed Grower's responsibility to care for and process these stocks to the highest possible degree of purity so that Canada may maintain and improve her favoured position in a keenly competitive market.

Early in the past year we were saddened by the sudden death of our former Secretary, Stanley Vigor. It was mainly due to the

efforts of Stan. Vigor that the Saskatchewan Branch of the Canadian Seed Growers' Association grew to be the strongest branch in the Dominion. His wise counsel is sorely missed and his passing is a challenge to us to maintain the prestige of the Branch which his untiring efforts helped to build. We pay tribute to his memory and the regrets of the meeting are conveyed to Mrs. Vigor.

Saskatchewan was honoured in the past year by the election of six of our growers to Robertson Associate membership. This is a coveted award by the Canadian Seed Growers' Association to grower members who have rendered distinguished service for many years in the production of Registered Crops. More will be heard of these awards later in the programme.

Distribution of Foundation Stock, 1949.

11 growers received Thatcher wheat
1 grower received Redman wheat
1 grower received Apex wheat
1 grower received Stewart Durum wheat
7 growers received Fortune oats
1 grower received Exeter oats
2 growers received Montcalm barley

The number of growers receiving Crop Registration Certificates in 1949 was about 1,246 — a decrease of some 500 from the previous year. The production of registered seed in Saskatchewan in 1949 was about one million bushels less than in 1948, but despite the drastic change in market conditions last year, we are pleased to report that the Saskatchewan Seed Grain Co-operative, formed by this Association a short time ago, enjoyed a very successful year. Approximately 14,195 acres of Grimm alfalfa, 185 acres of Crested Wheat grass and 143 acres of Arctic Sweet Clover were inspected in 1949 in Saskatchewan for registration. There was no brome grass inspected for registration.

The past year has been an active one for your Association and your Board of Directors has dealt with many matters which we feel are of prime importance to the membership. Your Board of Directors met on five different occasions since the last Annual Meeting and in addition there were two special meetings when members of the Board met with representatives of the Dominion and Provincial Departments of Agriculture and of seed handling organizations from Manitoba, Saskatchewan and Alberta.

In the Fall of 1948 the railway companies did not re-issue the Special Tariffs on Seed Movements which had been in effect for many years. This concession on the part of the railways undoubtedly played an important part in encouraging the movement of pure seed within the Provinces, thereby helping to promote the ultimate objective of the Canadian Seed Growers' Association—better crops of higher quality for the benefit of Canada as a whole. Your Board was very much concerned when the special tariffs were discontinued and when it was announced by the Dominion Government that a Royal Commission on Transportation had been set up to study freight rate probems, a Brief, protesting the

increased rates on seed, was prepared for presentation to the Commission. A special meeting was called at Regina with representatives of Departments of Agriculture and of Seed organizations in Manitoba, Saskatchewan and Alberta. After reviewing the Brief prepared by the Saskatchewan Branch, it was agreed that one Brief, presented on behalf of the seed organizations of the three Prairie Provinces would be more effective than would separate representations. Mr. F. L. Dickinson, President, Manitoba Crop Improvement Association, Winnipeg, was appointed to prepare and present to the Royal Commission a Brief on behalf of the following organizations:

Alberta Crop Improvement Association
Alberta Branch, Canadian Seed Growers' Association
Alberta Seed Growers' Co-operative Ltd.
Saskatchewan Seed Grain Co-operative Ltd.
Saskatchewan Branch, Canadian Seed Growers' Association
Saskatchewan Forage Crop Growers' Co-operative Marketing Association
Manitoba Branch, Canadian Seed Growers' Association
Manitoba Crop Improvement Association

Mr. Dickinson prepared an excellent Brief and very capably presented it before the Commission on June 3rd last. It was felt that members of the above mentioned organizations should have copies of the Brief for their information and these were accordingly distributed. We can only hope that our effort may result in restoring at least in part, the Special Seed rates which were in effect for so many years.

Early in the year we were glad to learn of the assignment given Dr. J. B. Harrington of the Field Husbandry Department, University of Saskatchewan, through the Food and Agriculture Organization at Washington, to assist the Egyptian Government in its Plant Breeding programme. This appointment is a tribute to the excellent work done by Dr. Harrington at our University. His valued advice and willingness to assist our organization at all times is greatly appreciated. Prior to his departure for Egypt, your Board of Directors presented to Dr. Harrington on your behalf, a token of appreciation. We anticipate sharing with him on his return his knowledge and experiences gained in the Land of the Pharoahs.

In those areas of the Province where moisture conditions were unfavourable, many Junior Grain Clubs were in the position of having to discontinue their work through lack of funds to purchase Registered Seed for planting their 1949 plots. Recognizing the value of Junior Grain Club work, your Board of Directors decided to encourage them by assisting to the extent of absorbing the difference in price between Commercial grain at their local station and the cost per bushel of Registered Seed. Under this plan 1,128 bushels of Registered Seed were distributed to 18 clubs in areas where the P.F.A.A. was invoked. Expressions of appreciation have been received from members of the various clubs and from the Extension Department of the University.

Following the last Annual Meeting, a Committee of your Board of Directors was named to investigate the possibility of instituting a programme of disease control in Cereal Crops. Messrs. Stanley Ingham, Ernest Jackson and Prof. K. W. Gordon, the committee so named, decided, in consultation with Dr. P. M. Simmonds, that the most serious problem confronting Seed Growers at the present time was loose smut of barley. Arrangements were, therefore, made with the Dominion Department of Plant Pathology at the University to test samples of seed for loose smut and likewise arrangements were made with the Field Husbandry Department so that producers of Elite Stock of barley could get their seed for planting 1949 plots, hot water treated under conditions which assured preservation of the identity of each lot of seed.

Not all our Elite Stock Producers availed themselves of this service and we trust that this does not indicate a lack of interest in producing, insofar as possible, seed carrying a minimum of disease infection. Just prior to seeding time a directive on control of smuts, root rots and ergot, prepared by Dr. P. M. Simmonds was distributed to all our members. We appreciate this valuable co-operation from our University and from Drs. Simmonds and Russell of Dominion Department of Plant Pathology and extend our thanks to them. We plan to continue the programme this year and our aim is 100% participation by the Elite Growers. The advent of the Wisconsin hot water treater, built under supervision of Professor E. A. Hardy, should lend every encouragement to the growers to have their seed examined for loose smut, and treated if necessary, since the grain can now be treated and dried without being removed from the bags.

Sixty-eight persons attended the Elite Growers' Short Course held at the University last July. It was a highly successful day and growers are of the opinion that each year's course is better than the preceding one. Specially prepared plots of registerable varieties were grown by the Field Husbandry Department for examination by the growers for off-types. The staff of the Plant Products Division was present for references and advice. Interesting and informative addresses by Dr. R. C. Russell, Dr. R. T. Coupland and Mr. W. G. Knox, a past-President of our organization, were much appreciated. A special word of thanks is due Mr. Howard Gerrie, Dr. W. J. White, Professor L. Shebeski and Mr. L. Bell for their generous help in making such a success of the day.

Last June your President and Vice-President attended the Annual Meeting of the Canadian Seed Growers' Association at Edmonton in their capacity of Directors of the National Body. Four other members of your Board also attended as did quite a large number of members from Saskatchewan. The Annual Meeting was an outstanding one in the history of the organization, having the largest attendance ever recorded. You will be receiving your Annual Reports in the near future so I shall not take up time with details of the meeting other than to mention that the motion brought forward by you here a year ago, to have 2nd generation recorded on the tag, was carried decisively.

As your delegate, I attended the Third Western Weed Control Conference at Edmonton last November. No doubt you have read reports on this Conference in the Press. Copies of the proceedings, which includes all papers presented, and resolutions put forward are now in the hands of your Directors and many of you will be receiving information thereon from the Director in your locality, if you have not already done so. I shall make reference to only one matter which was brought up at the conference by Mr. A. M. Wilson, Field Crops Commissioner for Alberta. This was a report on a Seed drill survey conducted last spring in Alberta and on a smaller scale in Saskatchewan. An analysis of samples taken from seed drills showed that over 50% of them were rejected from any seed grade and less than 20% of samples examined were of No. 1 seed grade. I shall refer to this situation later on.

As in past years, a joint meeting of representatives of Dominion and Provincial Departments of Agriculture and seed handling organizations of Manitoba, Saskatchewan and Alberta was held in Saskatoon in October to review production figures of Field Inspected grain in 1949 and try to relate them to market possibilities. Twenty-two persons attended the meeting. The Secretary will be presenting figures on production in his report so it will suffice for me to say that production of Thatcher wheat, especially, was on a large scale.

Because of this abundance and in view of the real need for seed in the dry areas of the Province, your Board of Directors prepared and presented a Brief to the Saskatchewan Department of Agriculture requesting freight assistance on the movement of sealed in bulk, Registered and Certified seed to those areas. Whilst the Government was quite sympathetic to the proposal and gave very careful consideration to it, they could not see their way clear to offer financial assistance when the Dominion Government and the railways had refused to bear any part of the costs of moving seed grain. At subsequent discussions with the Government, plans have been made for an extensive publicity programme in an attempt to make fullest possible use of our large production of Registered Thatcher wheat. We are highly appreciative of the splendid co-operation and assistance received from our Provincial Departments of Agriculture, Co-operatives and Municipal Affairs.

At the Royal Winter Fair in Toronto last November, Saskatchewan captured 49 placings on seed exhibits. Many of the exhibitors are members of the C.S.G.A. Time will not permit me to enumerate all winners, but I would like to mention Mr. Louis Wendell, Jr., Neudorf, who won Flax Championship and Mr. A. Kessel, Rosetown, who was crowned King of the rye growers. In addition to the Trophy put up by the Saskatchewan Branch C.S.G.A. for annual competition for the best sample of Registered Wheat at the Provincial Seed Fair, cash awards have been made to first and second prize winners. Your Board of Directors considered that awards should be extended to cover the major grains, grasses and legumes. Reference to the prize list for the Seed Fair will show that this has been done.

In concluding this summary of our year's activities, I wish to acknowledge the real support and co-operation which I have enjoyed from each and every member of the Board and our advisers, with a special word of appreciation to our Secretary. Mr. Holmes' interest in the Association and his meticulous care in attending to all the details of administration cannot be over-emphasized.

Let me refer now for a moment to the large stocks of Registered seed which we have produced this year. The unprecedented demand for Registered and Certified wheat, which reached its climax two seasons ago was responsible in large measure for the tremendous increase in production. I believe it might be well for us to consider the primary object of the Canadian Seed Growers' Association as set forth in the by-laws: namely, "To secure and maintain a high standard of excellence in the yield and quality of field and garden crops in Canada through the use of superior propagating stock" - - - and "by **developing a home market** and **if necessary** an export market for the disposal of surplus stocks". You will note that the home market commands our first attention. Have we developed this market to the full? The result of the seed drill survey which I mentioned earlier should answer the question. This situation offers a challenge to seed growers to intensify their advocacy for wider use of good seed by farmers generally.

Through their close association with Scientific Agriculturists across the Dominion, members of the Canadian Seed Growers' Association have a keener appreciation of the value to agriculture of research work, than has the general public, so it would seem that in this field also a job awaits us — that of making everyone more aware of this value and stressing the need for greater support to Agricultural research. A recent release by United States Department of Agriculture indicated that at the present time some 20,000 plant diseases of economic importance have to be contended with—in itself no small problem.

Referring to Dominion Government estimates for 1949-50 we find Department of Agriculture estimates of slightly less than 50 millions of dollars, a decrease of 10½ millions from previous year, whilst Department of National Defence estimates amounting to 375 millions of dollars, show an increase of 124 millions over previous year.

In making these comparisons I do so with the idea in mind that food production is a very essential part of National Defence and no country can be strong if it fails to maintain its agriculture at the highest possible level. Twice in the last thirty years the importance of agricultural production has been forcibly brought home to us. Lest we be caught asleep at the switch it behooves us to keep before the public the urgent need for increased support for agricultural research and education.

In conclusion; let us, as members of an organization held in high regard across the Dominion do our part by fulfilling our obligations to the utmost of our ability.

Stanley Horace Vigor
1886 - 1949

Secretary
Saskatchewan Branch
Canadian Seed Growers' Association
1929 - 1947.

ROBERTSON ASSOCIATES 1949

Thos. C. Boyes

Born in Scotland, Thos. C. Boyes came to Canada in 1920 and settled in the Kelvington District of Saskatchewan. Mr. Boyes commenced the production of registered seed in 1927 and has continued up to the present time with the exception of 1932, 1933 and 1934. Mr. Boyes has specialized in the production of oat and wheat crops and has successively grown registered crops of the Victory, Vanguard and Ajax oat and has recently turned to the production of the Victory oat again. He has produced a registered crop of Thatcher wheat every year since 1939. Beginning with an elite plot of the Victory oat in 1929, Mr. Boyes has subsequently produced Elite Stock of the Ajax oat, Vanguard oat and Thatcher wheat.

In addition to his seed growing programme, Mr. Boyes also produces Shorthorn cattle on his farm at Kelvington, Saskatchewan.

Charles A. Clark

Born in Ontario in 1878, Charles A. Clark homesteaded in the Meadow Lake District of Saskatchewan in 1912. Specializing in cattle production at first Mr. Clark did very little grain growing until the railroad reached Meadow Lake in 1930, although he grew his first crop for registration in 1926. He was a member of the Association for twenty-two years.

Since 1926, Mr. Clark has produced registered crops of Parkland and Superior brome grass; Fairway crested wheat grass; Mecca slender wheat grass; Ajax, Gopher, Valor and Victory oat; Dakold rye and Arctic sweet clover.

Retiring in 1948 Mr. Clark now resides at West Summerland, British Columbia.

James and Bertram Farquharson

The Farquharson Brothers (James and Bertram), came to the Zealandia District, Saskatchewan, from Scotland in 1922.

Commencing production of registered seed in 1929 they have continued up to the present time with the exception of 1933, 1934 and 1937. Over the years they have produced registered crops of oat, flax, wheat and barley. They produced their first Elite Stock in 1937—a plot of the Gopher. Subsequently, from 1942-1946 they produced Elite Stock of the Ajax oat; in 1939 Elite Stock of Reward wheat and from 1940-48 Elite Stock of Regent wheat.

Both brothers are active in many agricultural organizations, James being at present a Director of the Association and President of the Saskatchewan Branch.

Charles Gillyean

Born in England, Charles Gillyean settled near Lloydminster, Saskatchewan, in 1907. Mr. Gillyean became interested in the production of commercial seed and in 1910 his oat exhibit took two first prizes at the Lloydminster Seed Fair.

In 1933 Mr. Gillyean began registered seed production with a crop of the Banner oat which he continued to produce until 1938, when he changed to the production of the Victory oat which he has continued to produce up to the present time. From 1933 to 1939 he also produced registered crops of Marquis wheat and subsequent to 1944 registered crops of Thatcher wheat. Mr. Gillyean also produced Elite Stock of the Victory oat in 1945, 1946 and 1947.

Mr. Gillyean says that he has done his very best to justify this great award, purity and cleanliness being his first consideration ever since he started growing registered seed.

Ernest Jackson

Ernest Jackson of Eston, Saskatchewan, has been a member of this Association for twenty-one years. In an effort to obtain the best of seed, Mr. Jackson first secured his seed requirements from government stations, plant breeders and later from Dr. Seager Wheeler. This search for the best of seed, says Mr. Jackson, inevitably led to the C.S.G.A. and he began to process his own registered and elite seed in 1928. Mr. Jackson produced registered crops of Marquis wheat from 1928 to 1939 when he switched to Thatcher wheat which he has grown ever since. In addition he has grown registered crops of the Banner, Vanguard and Ajax oat as well as Fairway crested wheat grass. Mr. Jackson has been an Elite Stock producer continuously from 1930 during which time he has specialized in the processing of wheat and oat crops.

George M. Mohler

George M. Mohler, who has resided on his present farm at Maymont, Saskatchewan, since 1904, has been a registered seed grower for 19 years. Beginning in 1930 with Hannchen barley, which he has continued to grow ever since, Mr. Mohler has produced registered crops of the Victory oat, Royal flax and Marquis and Thatcher wheat.

As well as a long and faithful record as a seed grower Mr. Mohler has been an outstanding member of his home community having served on many local councils and committees.

Mr. Mohler says that of recent years his son Franklin deserves a good deal of credit for the success of their seed growing programme.

TABLE 4: The following growers from Saskatchewan have been elected as Robertson Associates up to and including 1949:

R. H. Carter	Muscow
T. C. Bennett	Laura
Geo. S. Canfield	Holbein
F. J. Dash	Hillesden
Frederic Kirkham	Saltcoats
R. D. Kirkham	Saltcoats
W. D. Lang	Cawston, B.C.
C. N. Lintott	Raymore
R. P. Robbins	Shaunavon
Jas. Rugg	Elstow
W. J. Saunders	Marshall
F. W. Townley-Smith	Lashburn
H. C. Weaver	Lloydminster
Percy Wheeler	Rosthern
Seager Wheeler	Rosthern
R. T. Geck	Kelvington
J. J. Green	Wallard
A. Shotter	Fillmore
George M. Mohler	Maymont
W. G. Knox	Tuxford
A. Brownlee	Kelvington
Ernest Jackson	Eston
Charles Gillyean	Lloydminster
Farquharson Brothers (James and Bertram)	Zealandia
Charles A. Clark	Meadow Lake
Thos. C. Boyes	Kelvington

YOUR JOB AND MINE

W. T. G. Wiener

Secretary, Canadian Seed Growers' Association, Ottawa.

Mr. Wiener said that the Canadian Seed Growers' Association has made a great contribution to agriculture and that its function provides a nucleus for the seed program for Canada. Pure seed of over three hundred varieties is available today, while in earlier years, there was no special list of accepted or recommended varieties.

In 1910, Mr. Wiener pointed out that there were seventy odd varieties with no reasonably pure stocks and each seed grower

was his own elite producer. Elite production work was done through mass selection of heads to produce enough seed for one-quarter of an acre. Elite growers then became members of the Canadian Seed Growers' Association and the single plant line was adopted for elite production about 1930, which gave more uniform stocks. In those earlier years, it was a training period for growers. The grower was his own seed grader and responsible for all bagging and sealing operations and furthermore he accepted all complaints.

Mr. Wiener pointed out that in 1923 a drastic change was occurring in that enough registered seed was getting into circulation and crops were improving generally. By 1928 there was not enough Foundation Stock to meet the requirement and consequently, below standard stock had to be used. It was necessary to speed up the production of elite stock. By 1938 a new change was introduced into the system of Foundation Stock. The Plant Breeders volunteered to produce Foundation Stock for the growers and this procedure did away with the five years which the grower previously had to spend on his stock before he got his returns.

The 1923-28 period, said Mr. Wiener, was one in which varieties were accepted on a specified basis and progress was made toward production in commercial quantities. Near the end of this period, the bulk line method of producing Foundation Stock was introduced. In the period 1927-33, elite stock was built up to provide thirty-seven varieties and strains, and an introduction was made into registration of vegetable crops and forage seeds. During 1936-38 rust resistant varieties were brought in and necessitated a switch on the part of the elite growers. A continuous expansion occurred from 1939-50 with the peak period in 1948. The war created a big demand in 1943 but an unnatural inflationary peak came later on which will affect what growers will do in the next five years.

Mr. Wiener said that the Plant Breeder has done an outstanding job in making Foundation Stock of cereal crops available. Their work has cut the cost of producing registered seed by one-half. The proper utilization and distribution of Foundation Stock is the most important link in the set-up of the Canadian Seed Growers' Association. While work is being done today with over three hundred varieties, there is needed for the best service to agriculture about four hundred and fifty varieties. The Institutions where Plant Breeders are doing their good work, are becoming overloaded with the production of Foundation Stock. The work is too extensive and they are looking for growers who will multiply these seed stocks. It calls for special training for a group of growers who are keenly interested in the work.

A good job has been done on cereals, said Mr. Wiener, and while a start was made on forage crops the program in this field seems to be standing still. Growers are not nearly so variety conscious as far as forage crops are concerned and it is most important that new strains of these crops be multiplied to bring about a more active forage crop program.

LETTER FROM Dr. J. B. HARRINGTON,

Plant Breeding Section, Ministry of Agriculture,
Giza, Egypt, December 28th, 1949.

Dear Fellow Members of the Saskatchewan Branch of the C.S.G.A.:

Greetings from Egypt. The land of the Sphinx and Pyramids, the land of the marvelous Nile River with its long narrow valley and fan shaped delta where Agriculture has flourished for more than fifty centuries. I am here for the purpose of improving the grain breeding program of Egypt and am finding the work most interesting. Egypt is doing very creditable agricultural research, being considered well ahead of other Middle Eastern countries in that respect. More than a thousand Egyptians have obtained advanced degrees (master's and doctor's) in leading American and other foreign Universities and many have been in Agriculture. Dozens of these highly trained personnel are now on the Ministry and Agricultural College staffs.

My job is chiefly to revise and add to the existing procedures for grain breeding and testing, variety purification and pure seed propagation, so as to have the Egyptian Government's program compare favorably with the most up-to-date programs to be found in Canada and the United States. We are putting the revised program into action as rapidly as possible. I have received the fullest co-operation from the staff of the Plant Breeding Section, the Under Secretary of State for Agriculture and the Federal Minister of Agriculture in this work. In fact at my suggestion the Government has ordered at least one excellent U.S.A. nursery plot thresher (The Vogel, made in Pullman, Washington) which I would greatly like to have at Saskatoon, for the work there and at our Tisdale and Bladworth nurseries as it is mounted on wheels and can be drawn behind a truck. Also ordered at my request are various other threshers, small plot drills, wheel hoes, grain cleaners, etc. The crops I am concerned with are wheat (primarily), barley, rice, maize (corn), soyhum and horse beans. In wheat the main job is to combine the high stem rust resistance of some varieties with the high yield, resistance to yellow stripe rust, resistance to flag smut, etc., of other varieties.

You will be interested particularly in the fact that my revision of the variety purification consists essentially of the bulk line method of producing elite stock seed (3 year procedure) as practiced by the best Canadian seed producers. The existing method here was very painstaking and more like the Australian method but in my opinion less scientific and more expensive than the C.S.G.A. Method.

Mrs. Harrington and I are both enjoying our stay in this amazing country. We are thoroughly enjoying the profuse flowers in gardens, on trees, and on vines, the various beautiful trees and shrubs and an outside mid-day temperature of 65 degrees F. and

a low at night of not lower than 45 degrees F. We had a nice Christmas with Canadian, British and American friends. Nevertheless we miss greatly our friends in Saskatchewan.

I am particularly sorry to miss the Annual Meeting of the Saskatchewan Branch of the C.S.G.A. Here's wishing you an excellent meeting and the very best for the year 1950.

Most Sincerely,

"James B. Harrington."

REPORT ON THIRD WESTERN WEED CONTROL CONFERENCE

J. Farquharson,
Zealandia.

Attending the Third Western Weed Control Conference in Edmonton last November was an extremely interesting experience and I can assure you that I greatly appreciated the opportunity of attending as your representative.

The 1948 Conference had been so much worthwhile that your Past President, Mr. E. Jackson of Eston, decided to accompany me to Edmonton on his own account.

The factual information brought out at the Conference has been reported in the Press and bulletins are available to all farmers sufficiently interested in Weed Control who request same from the Field Crops Branch or the University of Saskatchewan.

Many interesting sidelights could be recorded, as for example, conversations with Mr. F. W. Sugden, of a large Chemical Company of London, England. Several of this Company's products are now being marketed in this country.

Contrasting methods of chemical weed control in Britain with those in use here, Mr. Sugden mentioned that dusts with low 2,4-D acid content are general favourites, inasmuch as farmers can make use of machines which they use for broadcasting commercial fertilizers, to apply the 2,4-D dust at rates up to 500 lbs. per acre. Using this large quantity of filler in the product also has the advantage of minimizing the danger of damaging crops by overdosing with chemical. Dr. K. W. Neatby's address on his recent trip to Britain delivered in masterly style, gave wonderful insight into agricultural research being carried on by the various institutions in that country. He remarked on the intense interest which the urban dwellers took in agriculture, evidenced by huge attendance at agricultural shows, where Midways and sideshows are conspicuous by their absence.

Professor E. A. Hardy of the University of Saskatchewan presented some of the problems encountered in weed control by

cultural methods and discussed at some length various machines and their features, good and otherwise. This was one of the outstanding parts of the whole Conference demonstrating the lack of general application of proven efficient use of farm machinery.

An item having special appeal to seed growers was the contribution by Mr. A. M. Wilson, Field Crops Commissioner of Alberta in which he referred to the continual re-seeding of weeds, by farmers using seed containing unbelievable numbers of weed seeds.

In view of the extensive acreage which will doubtless be treated with 2,4-D this year, it would be very interesting to have a survey made to determine average results obtained by farmers both as to weed control plus yield difference through treatment.

Doubtless much more complete information on newer selective chemicals will be available for the 1950 Conference to be held in Regina. We look forward to attending this Meeting.

RECENT DEVELOPMENT IN CHEMICAL WEED CONTROL

H. A. Friesen
Dominion Experimental Station,
Scott

The rapid development of extensive mechanized farming on the prairies, with its attendant weed problem, has caused farmers to watch with keen interest, the progress of the scientist in his search for chemicals to aid them in their constant struggle to control weeds. Early trials with "selective" chemicals such as copper sulphate and sulphuric acid were begun in 1900 and while of little practical import they served to keep the issue to the fore. The first real advance came twenty years ago with the introducion of sodium chlorate. While this chemical was not "selective" in its action, it found a wide use in the control of persistent perennial weeds on agricultural land and in the control of weeds and brush along railways and highways. Early in the 1940's the dinitro herbicides were introduced to Western Canada. Trials conducted by research men and by farmers proved them to be quite effective in controlling young plants of wild mustard, stinkweed and several other broad-leaved annuals without injuring the growing cereal and flax crops. The large quantities of water required (60 to 80 gallons per acre), the expensive machinery necessary for application and the high cost of the chemical were limiting factors in the wide use of these herbicides. The advent of the new hormone weed killer 2,4-D, in 1945, which possessed similar "selective" properties, with greater ease of application and at a lower cost, fairly well eclipsed the dinitro herbicides.

During the past five seasons a wealth of information has been accumulated with regard to the use of 2,4-D for the control of annual weeds in grain crops. Five major factors appeared to determine the end result to be expected from the use of 2,4-D. These

factors were 1) weed species; 2) stage of growth at the time of treatment, 3) soil and climatic conditions; 4) formulations and 5) dosage or rate of application. Because of the pronounced influence of the factors on one another, ranking them in order of their importance did not appear to be feasible.

With regard to species of weed, a wide variation was found to exist. The range of variation extended from, wild mustard, which was sensitive to dosages of as little as 2 ounces of 2,4-D acid per acre, even after flowering, to the near immunity of wild buckwheat, peppergrass and wild oats. Between these extremes, in their relative order of susceptibility, were stinkweed, tumbling mustard, lamb's quarters, flixweed, Russian thistle and red root pigweed.

In each of the years during which tests have been conducted it was apparent that weeds were most easily and quickly destroyed if treated during the early or seedling stage of growth. It has been further noted that weeds not only acquired different degrees of tolerance as they grew older, but that the species differed in the rate at which this tolerance was acquired; for example, wild mustard remains highly susceptible until flowering time whereas Russian thistle has acquired considerable resistance soon after the seedling stage is past and the plants have begun to develop side branches. In the light of these findings the value of treatment in the early stages of growth is of first importance.

Warm sunny weather coupled with ample moisture is conductive to rapid succulent growth, which has been found to markedly influence the response of plants to 2,4-D. This was clearly illustrated in the results from five experimental stations in Saskatchewan in 1948. Thus at Indian Head, where growing conditions were good, Russian thistle was killed in the seedling stage with as little as 2 ounces per acre of ester, at Swift Current and Saskatoon under less favorable moisture conditions 4 ounces of ester were required, while at Scott and Melfort, both points experienced severe drought, 5 to 8 ounces of ester were required for comparable kills.

Formulation and dosage of 2,4-D required is largely dependent on the above three factors. Treatments made on highly susceptible weeds under good growing conditions permitted the use of very low dosages. Under these conditions, stinkweed and Russian thistle seedlings were killed by as little as 2 ounces per acre of ester or amine, while under adverse conditions of growth or after these weeds were approaching maturity, 5 to 10 ounces of amine or 4 to 8 ounces of ester per acre were required for a similar degree of control. Under the existing climatic conditions on the prairies, the sodium salt formulation of 2,4-D has been found to be inefficient and is no longer recommended.

Yield increases due to weed control by means of 2,4-D depend almost entirely on the severity of the weed infestation and the timeliness of the treatment. Early treatment is essential because

a heavy weed infestation may severely reduce crop yields if not eliminated well before the crop has advanced to the shot blade or heading stages. Furthermore, late treatment is hazardous from the standpoint of crop damage.

While the intrinsic value of 2,4-D lies in its selective properties, experimental and field observations quickly pointed to the fact that cereal crops and flax often suffered rather than benefited from the use of 2,4-D. The extent and severity of the injury appeared to be related to a number of factors such as the state and condition of crop growth, as well as the formulation and dosage applied. Varietal differences within crops also tend to influence the effect on the crop. Since the stage of crop growth appeared to be the chief governing crop response, intensive studies to determine the stage at which cereals and flax are most tolerant to 2,4-D have been initiated by a number of research workers and their results have been summarized.

While the evidence presented by different workers is perhaps not yet in complete agreement it is however possible to briefly summarize their findings under the following eight headings:

1. The stage of crop growth at the time of treatment would appear to be one of the chief factors influencing crop response to 2,4-D. Experimental evidence showed in 1949 that there are two more or less clear cut and widely spaced periods of growth when serious damage may be inflicted by the use of 2,4-D on the growing crop. These periods are (1) an early period from emergence until the crop is 5 to 6 inches tall (a time period of 22 to 28 days) and (2) a later period from mid shot blade until head emergency or the completion of flowering. From the standpoint of crop tolerance and weed control, the ideal time of treatment is directly after the early period of susceptibility has passed, that is when the crop is 7 to 10 inches tall. The effect of 2,4-D applied too early, has been generally manifested in the crop by an abundance of morphological deformities, reduced plant vigor and yield. Late treatments have tended toward straw weakness, sterility and marked reduction in yield.

2. The effect of growing conditions was somewhat difficult to appraise from the evidence submitted. It was of interest to note, however, that while adverse growing conditions increased crop tolerance, the pattern of crop response at different growth stages was not appreciably altered.

3. From the reports, it would appear that wheat showed more tolerance than either oats or barley. The differences between oats and barley were somewhat inconsistent from station to station.

4. All workers report cereal crops to be more tolerant to the amine than to the ester and highly tolerant to the sodium salt formulation applied as a water spray. The ester applied as dust at Indian Head had roughly the same effect on the crop as the

sodium salt spray. The amine in oil was found to be less tolerant to crops than the ester in water.

5. Although experimental evidence showed some significant difference between varieties of the same crop, further work would seem necessary to establish the exact nature and extent of these differences.

6. Weather conditions such as clouds, rain, wind and temperature will require further investigation before a statement can be made.

7. Wheat, oats and barley were found to be highly tolerant to pre-emergence treatments.

8. Quality tests on wheat reported from the Experimental Stations at Scott and Indian Head in 1947 and 1948 have shown no serious effects on quality as the result of 2,4-D treatments at rates ranging up to 16 ounces of acid equivalent per acre.

Linseed flax should be treated as soon as weed growth warrants, providing the flax plants have already formed 4 to 5 true leaves. Severe damage to flax may result if treated after the early bud stage.

Perennial weeds as a rule offer more resistance to control with 2,4-D than do annuals. Three approaches to controlling them are now under test, these are: 1) control in growing crops, 2) complete eradication using 2,4-D alone, and 3) eradication using a combination of 2,4-D and cultural methods.

The use of 2,4-D in growing crops infested with perennial weeds is proving of far-reaching value. The object of the treatment being control rather than eradication, thereby removing or greatly reducing their competition with the crop, preventing seed setting and making harvesting easier. Unless legumes or flax are the crop being treated, the ester formulation is preferable. The recommended dosage hinges around 6 to 8 ounces of acid per acre and should be applied when the perennials have fully emerged. Root kills from this type of treatment are usually slight. Weeds that respond well to this type of treatment are Canada thistle, sow thistle, bindweed and leafy spurge.

The eradication of perennials on land not in crop has not as yet proven too successful. At present, the evidence indicates that no over-all recommendation can be made for the wide-spread use of 2,4-D for the control of even the more susceptible perennial weeds. Combinations of tillage and 2,4-D offer considerable promise for the control and eradication of Canada thistle and sow thistle. Seeding infested areas to grass, preferably crested wheat grass holds forth promise of controlling the previously named perennials and also some of the persistent perennials such as hoary cress and leafy spurge.

Time does not permit an extensive discussion of the merits of the many 2,4-D brands and practical applications of these on the

farm. Nevertheless, I should like to point out a few interesting facts in this regard:

1. All herbicides must be registered for sale under the Agricultural Pests' Control Act and the containers must bear labels stating the chemical and physical make-up, the specific and complete claims as to the purposes of the product and the practical recommendations for its use. As of November 1st, 1949, 69 amines, 56 esters and 22 sodium salts or a total of 146 brands of 2,4-D were registered in Canada. The fact that the majority of these brands vary considerably in active acid content has led to considerable confusion on the part of the farmer user. Standardization or equalization of acid content at least within a formulation has been strongly suggested to the manufacturer. Additional components such as carriers, emulsifiers, diluents, etc., may however, materially change the behavior of brands within a formulation, or even the formulation itself, thereby greatly complicating attempts at simplification.

2. The sale of 2,4-D in both the liquid and dust form poses a further problem to the user. Evidence to date indicates that where the dust form is used, it is advisable to apply ½ to 1½ ounces of acid more per acre than where the spray is used. This extra cost for chemical may, however, be offset where the acreage to be treated is large and water several miles distant.

3. The use of 2,4-D as a substitute for tillage in the preparation of summerfallow does not appear warranted because of the large number of resistant weed species and volunteer grains which infest the treated area.

4. The use of 2,4-D to control woody growth such as snowberry, willow and young poplars on road allowances, etc., has met with some success.

After reviewing the behavior of 2,4-D in the field the need for research to determine the reasons for this behavior is of considerable urgency. Upon the successful working out of the principles involved depends to a large extent, the stability and extension of weed control methods. Corns of the University of Alberta has suggested that the reason for the easier eradication of young annual plants by 2,4-D lies in the fact that these young rapidly growing plants have a high proportion of meristematic cells. Furthermore ample soil moisture and high temperatures would necessarily be associated with the speed and effectiveness of the reaction.

2,4-D movement throughout the plant following initial penetration is associated with the movement of sugars and the foods manufactured in the leaves and transported to regions of active growth or to storage organs. This would appear to be the reason why perennial sow thistle for example, is more susceptible to 2,4-D if treated in the bud flowering stage, when food reserves are low, than if treated in the early or rosette stage.

Paatela of the U.S.D.A. has advanced the theory that a number of plants produce growth substances not unlike 2,4-D and the metabolism of these substances is directly related to the vigor of growth. Plants such as flax developing at a normal rate of growth have an abundance of this substance. Consequently, only a small dosage of 2,4-D would upset the physiological balance of the plants. Conversely the same plants growing under adverse conditions would have an inadequate supply of this growth substance, hence a considerably higher dosage of 2,4-D would be required to upset the physiological balance of these plants. Paatela is at present engaged in proving this theory.

Ease of penetration was at first advanced as the possible reason for differences in plant reaction to 2,4-D. It was felt that the ester forms which were usually in an oily carrier were more effective due to their greater ease of penetration. This has been found to be only partially correct, since tests with radioactive substances have shown that the difference in reaction between beans and oats was largely biochemical.

Molecular structure and arrangement, probably of the proteins, governs to a large extent the reaction of plants to 2,4-D. Although a great deal of effort has already been expended in an effort to explain herbicidal action, a great deal more will yet have to be expended before a reasonably clear picture is available.

Although this paper has been largely confined to 2,4-D a number of newer herbicides are now on the market and should be mentioned.

2,4,5-T (2,4,5-trichlorophenoxyacetic acid) has somewhat similar properties to 2,4-D, however, it is less effective on a number of field weeds, while being much higher in cost. It has a place, however, in the control of rose bush, black berries and other related brambles which are highly tolerant to 2,4-D.

T.C.A. (Trichloroacetate) applied as a spray at the rate of 80 to 100 pounds of acid per acre looks promising for the control of quack grass. The extremely high cost, however, makes its use economically feasible only for spot treatments. Experimental work in the United States indicates that a combination of tillage and chemical will permit the effective use of much lower rates. While T.C.A. is selective to grasses, present evidence would indicate that both cultivated and wild oats have as much resistance to it as flax. Wheat and barley, however, are quite susceptible to T.C.A.

Chlorosol A (Sodium salt of alpha hydroxy beta trichlorethyl sulfonic acid) and IPC (Isorpropyl N-phenyl carbomate) are two products introduced to control annuals as well as perennial grasses. Evidence at present is too scant to make any definite statements.

Methoxone (2 methyl 4 chloro phenoxyacetate) was developed in England and is used there and in the Scandinavian countries in place of 2,4-D. Methoxone does not appear to be as effective a weed killer and is considerably higher in cost. It has, however, been

suggested that in view of flax being so much more tolerant to it than to 2,4-D, that tests be carried out in this country to study this aspect.

While present day herbicides have as yet not approached perfection and a host of questions still remain unanswered, it must be conceded that a great forward step has been made. This statement can be verified by the fact that a survey made in 1949 showed that a total of 8,200,000 acres of crop had been treated in the three prairie provinces, 4,000,000 of these acres were in Saskatchewan.

A REVIEW OF SOME OF OUR MAJOR PLANT DISEASE PROBLEMS[1]

P. M. Simmonds[2]
Dominion Laboratory of Plant Pathology,
Saskatoon, Saskatchewan

In this review, some attention will be given, firstly, to seed-borne diseases and the problems involved and, secondly, to a discussion of our major diseases which appear in the crop, whether seed-borne or not. It is quite natural that cereals, especially wheat, must receive most consideration in speaking of plant diseases in Saskatchewan.

Seed-borne Diseases

Survey studies of cereal seed samples conducted in Western Canada have shown, on the whole, no really serious problems. There are, however, problems of seed-borne disease dissemination that must be recognized and attacked by all the means available to the seed grower and farmer. The principal maladies carried on the seed are the smuts and common rootrot fungi; ergot is carried in wheat, barley, and rye seed samples. Mechanical injuries must also be mentioned in seed examination discussions.

Studies with seed samples collected in Manitoba over a four-year period were reported by Greaney and Machacek (Sci. Agr. 26:59-78, 1946). They found that, in a total of 1,710 samples of wheat, only 3.4% carried more than a trace of bunt (**Tilletia Tritici** and **T. laevis**). The results for 518 samples of oats showed 76% had sufficient smut (**Ustilago Avenae** and **U. levis**) to make treatment necessary. The barley samples, totalling 747, revealed 73% with sufficient smuts (**Ustilago Hordei** and **U. nigra**) to necessitate treatment.

In 1942, Mead, Russell and Ledingham (Sci. Agr. 23:27-40, 1942) published the results of a survey of Saskatchewan wheat seed

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[1] Contribution No. 1013 from the Division of Botany and Plant Pathology, Science Service, Dominion Department of Agriculture, Ottawa.

[2] Plant Pathologist in charge.

samples. They found in a total of 542 samples, 8% with a sufficient amount of smut to make seed treatment necessary.

The above smut determinations were made by means of the centrifuge test, which is a procedure applicable only to surface borne smuts. In this test a small sample of the seed is washed with water or with water to which a trace of detergent has been added. The water, carrying the smut spores, if any, and other particles, is centrifuged to concentrate the residue, which is then examined microscopically. This test has been in use for many years and has been found to be reliable. Therefore, by employing this technique one can predict, within reasonable limits, approximately how much smut should apear in the field. This point was thoroughly checked by Russell (Sci. Agr. 26:372-380, 1946), who conducted extensive field experiments using clean seed and seed samples carrying different amounts of smut spores. Samples shown to be clean by the centrifuge test rarely show smut in the field. As the amount of smut spores carried on the seed is increased, there tends to be an increase of smut in the field. This relationship, in general, is true for wheat, barley and oats.

While the centrifuge test is satisfactory for determining the presence of smut spores carried on the surface of the seed, special procedures are necessary to detect the true loose smuts. These smuts, caused by **Ustilago Tritici** in wheat and **U. nuda** in barley, are at times very troublesome. Only recently have methods been devised to detect them by routine methods in the laboratory. Procedures for this determination have been studied at both the Winnipeg and Saskaoon laboratories. In the Saskatoon method, the embryos are separated from the kernels by chemical means, cleared with suitable reagents and examined (See Simmonds, Sci. Agr. 26:51-58, 1946). Using this method, with some modifications, Russell (Unpublished data) compared many samples of barley in relation to the smut fungus content of the seed and the amount of smut which appears when the seed is sown and grown to maturity in the greenhouse or field. His data were quite conclusive in proving a definite relationship; thus the seed of low pathogen content produced few smutty heads and seeds of high pathogen content gave high smut percentages in the field.

The above statements indicate, therefore, that reasonably good tests are available for the detection of all smuts carried by cereal seeds.

Another disease producing fungus, carried by wheat and barley seeds chiefly, is **Helminthosporium sativum,** which causes common rootrot. When the seed sample surveys mentioned above were made, data were gathered on the incidence of this pathogen. Over a period of years, traces of **H. sativum** may be found on 50% of the wheat samples and on most barley samples. Average number of kernels infected for wheat samples was about 3% and for barley around 5%. From the standpoint of incidence on seeds, **H. sativum** is as important or more so than the smut fungi. It has been difficult, however, to check this point under field conditions because

of the common occurrence of **H. sativum** in the soil. The significance of the seed-borne infections tends to be lost unless one works with sterile soil, a procedure that is only practicable under greenhouse conditions.

Ergot is another fungus disease commonly found in wheat, barley, and rye seed samples. The ergot bodies are easily seen and the amount carried in a sample easily determined.

A review of cereal seed troubles would be incomplete if mechanical injuries were not mentioned. In wheat, barley and oats (also flax), small fractures in the protective layers covering the embryos are common. These can only be determined by microscopic examination. Samples having much mechanical injury are easily invaded by fungi, causing weak germination. Injured seeds also become mouldy if exposed to dampness in storage. A seed treatment, such as formalin, produces severe damage if applied to mechanically injured seed; on the other hand, mercury treatments tend to protect such seed.

Any survey of cereal seed samples will reveal many fungus and bacterial pathogens that at the present time are of minor importance. The pathologist must be ever vigilant, however, to note any unusual increase in the occurrence of disease producing organisms. This is important to prevent the introduction into Western Canada of such diseases as flag-smut of wheat and dwarf bunt of winter wheat.

Recent work has shown that wheat, barley and oat seed carry a natural bacterial flora that is at least antibiotic to **H. sativum.** If this flora is destroyed in any way, there is every likelihood of greater infection and damage. Further studies may indicate that the natural seed flora must be considered in any seed examination or seed treatment program.

In concluding the review of seed-borne diseases, I would like to emphasize the need for a seed examination service for disease appraisal. Such a service would provide, (1) an annual record on the occurrence of seed maladies, (2) possibilities of certification relating to health status, (3) guidance in tracking down disease sources in any region, (4) guidance in seed treatment, and (5) the means for watching importations to prevent the introduction of serious maladies.

Diseases in the Crop

In a discussion of plant diseases in Western Canada, it is customary to divide them into three major groups, the rusts, the smuts, and root diseases. It is of interest to note regarding these that the rust infections are largely air-borne, the smuts, seed-borne, and the root diseases, soil-borne. This observation, of course, directs our attention to somewhat different methods of control for each group.

The rusts, particularly stem rust of wheat, are kept under control by the use of resistant varieties. There is every reason to

believe that this favorable situation will continue for a long time. The plant breeder, however, must always be alert to the possibility of an increase in virulent races of the rust fungus.

The smuts can be kept under control by seed treatments. Furthermore, varieties resistant to smuts are being introduced more and more each year. It will be observed here that seed growers have alternative control measures, either resistant varieties or seed treatments. Hence the control of smuts is on a more secure basis than if control depended on resistance only, as with the rusts.

The rootrot diseases, as found in Saskatchewan, are of three main types; take-all, browning, and common rootrot. Take-all was discovered here in 1923 and was very destructive several years in wheat crops in the northeastern crop zones. It was soon brought under control by crop rotation (See Russell, Dom. Dept. Agr. Ottawa, Bul. 170, 1934). Browning rootrot caused considerable damage in wheat, as well as much alarm to farmers for many years, until it was found that phosphate fertilizers would keep it under control. The many valuable research contributions by Professor T. C. Vanterpool on this problem must be acknowledged.

The remaining root disease problem, namely common rootrot, has been a difficult one. It attacks all cereals. The symptoms, generally speaking, are not conspicuous. Several fungi may be involved in an attack. The most prevalent one is **Helminthosporium sativum,** which attacks wheat, barley and rye. Common rootrot in oats is caused by **Fusarium spp.** The present discussion will be confined almost entirely to wheat and barley.

In the case of seed-borne **H. sativum,** the sprouting seeds are killed before or soon after emergence. This results in an irregular emergency (germination) and a poor stand and weed growth is encouraged.

Surveys of wheat and barley fields at any time will reveal varying degrees of infections by **H. sativum.** Observations in the early summer will reveal primary lesions on the seedlings near the soil surface; later, lesions will be found well established in the crown, on the subcrown internode, and basal portions of the culms. Lesions may also be found, as the season advances, on the leaves, heads, and kernels. When kernels become infected, the malady is then carried by such seed.

The amount of disease that appears in any field varies widely even within a district. The reason for these variations is not well understood. If, however, the disease cycle is considered in this connection, some reasonably plausible interpretations can be made. Infections occur on the seedlings and additional ones may occur on the plants throughout the growing season and conidia are produced in abundance from most of the lesions. Conidia continue to be produced in lesions on the stubble throughout the fall. The conidia fall to the soil surface and are washed about by rain water. This dispersion of conidia may explain the irregular pattern of

common rootrot incidence in a field. It is known that **H. sativum** may be suppressed by other microorganisms, in the soil. Some soil microorganisms are more active than others in suppressing **H. sativum.** It is known also that the soil's content of microorganisms may be greatly changed both in quantity and kind by soil type, cultural methods, rotations, fertilizers, weather conditions, and so forth. Thus for a fungus, such as **H. sativum,** which is very sensitive to the activity of the microorganisms with which it is associated in the soil, great fluctuations in its parasitism are to be expected. Soil microorganisms may naturally kill many germinating **H. sativum** conidia as well as suppress germination in large numbers of them. It is likely that some such activity is the explanation of the variations in the appearance of the disease.

In the control of common rootrot of wheat and barley, caused by **H. sativum,** it will be well to keep in mind the tendency for the inoculum (conidia) to accumulate on and in the top soil. If this inoculum in the surface soil is found to be of primary importance, then efforts towards control of the disease will revolve around the suppression of it, perhaps through cultural methods, as mentioned above. It may even be feasible to attack the inoculum layer by applications of fungicides.

In conclusion, I would like to emphasize again, (1) the importance of a seed examination service for the detection of seed-borne diseases, and (2) the advisability of having an extension pathologist to give leadership in the dissemination of information on plant diseases. Furthermore, promising approaches towards the control of common rootrot disease of cereals are emerging from the researches now underway.

REPORT OF RESOLUTIONS COMMITTEE

"Resolved that this meeting express our sincere thanks to Dr. W. P. Thompson, President of the University of Saskatchewan, for making available to the meeting the facilities of the University, and to the staff which contributed greatly to the success of the meeting."

—Carried.

"Resolved that this meeting express our appreciation of the publicity given by the daily and weekly press to our meeting and to the use of good seed as a means of improving the quality of Canadian grown grain."

—Carried.

"Resolved that this meeting express our thanks to Dr. P. M. Simmonds and H. Friesen for their timely and instructive addresses, and to Professor M. Champlin for his inspiring address of welcome."

—Carried.

"Resolved that this meeting express our thanks to W. T. G. Wiener for his being present, and for his timely talk, and for his untiring efforts in helping the Branch and its membership throughout the year."

—Carried.

"Resolved that this meeting express our appreciation to the Saskatchewan Department of Agriculture for its careful and sympathetic consideration given to the brief presented by the Branch requesting assistance on the movement of registered seed, and for the assistance given to conduct an intensive publicity campaign."

—Carried.

"Resolved that this meeting express our appreciation to the Saskatchewan Department of Agriculture for the valuable services of our Secretary, V. B. Holmes, and may we express our wish that his services be retained for the year 1950."

—Carried.

"Resolved that this meeting express our appreciation to L. Bell and the staff of the Plant Products Division of the Dominion Department of Agriculture for the assistance and advice given to the Branch and to the membership."

—Carried.

"Resolved that this meeting express our appreciation to all grain handling organizations for their assistance in the distribution of registered seed."

—Carried.

"Resolved that this meeting express our approval of the policy of the Board of Directors meeting in 1950 to arrive at a schedule of prices for field inspected seed; these prices being a guide to the grower in marketing his seed."

—Carried.

"Resolved that this meeting express our satisfaction of the Elite Growers' Short Course held in 1949 and the wish that a similar Course be arranged for 1950."

—Carried.

"Resolved that this meeting express our appreciation to Major H. G. L. Strange for the excellent work done by the Publicity Committee of the Canadian Seed Growers' Association in encouraging the movement of pure variety seed, and for his valuable contribution to the production of the film "A Sower Went Forth."

—Carried.

"Resolved that this meeting express our appreciation to officials of the Extension Department of the University of Saskatchewan, and particularly to Professor K. W. Gordon, for their efforts in the splendid set-up of the exhibits at the Provincial Seed Fair in the School of Agriculture building."

—Carried.

"WHEREAS first generation registered seed is grown by elite growers from seed produced in elite plots which have been thoroughly rogued from off types and other impurities, and is purchased by farmers to improve and maintain purity as to variety in their crops and,

WHEREAS appearance of this seed as far as bleaching is concerned is no way detrimental to varietal purity of the seed

THEREFORE BE IT RESOLVED that first generation registered seed be graded number one when such seed is bleached but found to be well cleaned and free from weed seeds."

—Motion Lost.

"WHEREAS the production of registered alfalfa seed is of great economic importance to the farmers of Saskatchewan and,

WHEREAS sweet clover is a weed which cannot be mechanically removed from alfalfa seed and must be rogued from the field,

THEREFORE BE IT RESOLVED that no field inspections be made until the sweet clover is in bloom."

—Carried.

AWARDS FOR REGISTERED SEED AT PROVINCIAL SEED FAIR

TABLE 5: Winners of shield and special prize money for wheat in the crop years 1935-1948 inclusive:

Year	Shield and First Prize	Second Prize
1935—	H. G. Neufeld, Codette	M. G. Trowell, Saltcoats.
1936—	H. G. Neufeld, Codette	T. Teare, Marquis.
1937—	T. Teare, Marquis	H. G. Neufeld, Codette.
1938—	W. G. Knox, Tuxford	K. Bocskai, Leask.
1939—	T. Teare, Marquis	(No Second.)
1940—	Farquharson Bros., Zealandia	R. W. Roberts, Briarlea.
1941—	Farquharson Bros., Zealandia	W. G. Knox, Tuxford.
1942—	R. P. Robbins, Shaunavon	W. G. Knox, Tuxford.
1943—	M. G. Trowell, Saltcoats	Richard Platte, Nipawin.
1944—	W. G. Knox, Tuxford	H. A. Meyers, White Fox.
1945—	A. J. Cox, Eston	R. Vandeveld, Viscount.
1946—	R. Vandeveld, Viscount	W. G. Knox, Tuxford.
1947—	W. G. Knox, Tuxford	Geo. S. Canfield, Holbein.
1948—	R. Vandeveld, Viscount	W. G. Knox, Tuxford.

In 1949, the Board of Directors agreed that special cash prize awards by the Branch should be distributed to cover more grains than wheat and also forage seeds as well. A first prize of $10.00 and a second prize of $5.00 is made available to exhibitors of wheat, white oats, six-rowed barley, two-rowed barley, flax, brome grass, crested wheat grass and alfalfa in the registered class at the Provincial Seed Fair. The shield is available for the first prize winner in wheat.

TABLE 6: Winners of shield and special prize money for the 1949 crop year:

First Prize	Second Prize
WHEAT	
A. J. Langdon, Moose Jaw (Shield)	N. Blosser, Kelvington.
WHITE OATS	
A. Gray, Nut Mountain.	N. Blosser, Kelvington.
SIX-ROWED BARLEY	
S. Ingham, Balcarres.	L. Wendell, Neudorf.
TWO-ROWED BARLEY	
(No Award.)	(No Award.)
FLAX	
M. Amundrud, Garrick.	(No Award.)
BROME GRASS	
(No Award.)	(No Award.)
CRESTED WHEAT GRASS	
H. Guillot, North Battleford.	B. Rugg, Elstow.
ALFALFA	
(No Award.)	(No Award.)

REMEMBER THESE DATES

June 21st, 22nd and 23rd

1950

The Annual Meeting

of the

Canadian Seed Growers' Association

will be held at the

LORD BEAVERBROOK HOTEL

FREDERICTON, NEW BRUNSWICK

Direct Your Reservations for Accommodation Early to the Lord Beaverbrook Hotel.